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CLAIMS

1.(Amended) An optical head, comprising:

a light source for radiating laser light;

an objective lens for focusing the laser light that is radiated from the light source onto an information recording medium;

light splitting means for spatially dividing the laser light that is reflected by the information recording medium and that passes through the objective lens into a plurality of light fluxes;

a light receiving element for receiving the plurality of light fluxes divided by the light splitting means;

tracking error signal detection means for detecting a tracking error signal based on the plurality of light fluxes received by the light receiving element; and

spherical aberration detection means for detecting spherical aberration that occurs at the objective lens, based on the plurality of light fluxes received by the light receiving element;

wherein the light splitting means has six regions that are divided by a first splitting line that is substantially parallel to a longitudinal direction of an information track formed on the information recording medium, and second and third splitting lines arranged in parallel that are substantially perpendicular to the first splitting line, and that are substantially symmetrical about the optical axis of the objective lens;

wherein the tracking error signal detection means generates a first push pull signal by calculating signals detected by receiving light fluxes created by laser light passing through those two of the six regions that are disposed between the second and third splitting lines, and generates a signal for correcting the offset of the first push pull signal caused by movement of the objective lens by calculating signals detected by receiving light fluxes created by laser light passing through those four of the six regions that are disposed on the outer side of the second and third splitting lines; and

wherein the spherical aberration detection means compares a first focal point shift amount obtained by detecting the size of a light spot formed by focusing the light fluxes created by laser light passing through two regions that are disposed between the second and third splitting lines, onto the light receiving element, and a second focal point shift amount obtained by detecting the size of a light spot formed by focusing the light fluxes

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created by laser light passing through the four regions, which are disposed on the outer side of the second and third splitting lines onto the light receiving element, to generate a spherical aberration correction signal for detecting the spherical aberration generated at the objective lens.

2.(Amended) The optical head according to claim 1, further comprising tilt detection means for detecting the relative inclination between the objective lens and the information recording medium,

wherein the interval between the second and third splitting lines is narrower than the width, in the longitudinal direction of the information track of the information recording medium, of the region in which 0-order light and ±1-order light that are diffracted at the information track of the information recording medium are superimposed; and

wherein the tilt detection means compares the phase of the first push pull signal obtained by calculating signals detected by receiving light fluxes created by laser light passing through the two regions that are disposed between the second and third splitting lines, and of a second push pull signal obtained by calculating signals detected by receiving light fluxes created by laser light passing through the entire region of the light splitting means, to generate a tilt error signal for detecting the relative inclination between the objective lens and the information recording medium.

3. (Cancelled)

4. (Cancelled)

5. (Cancelled)

6. (Cancelled)

7. (Amended) The optical head according to claim 1,

wherein the signal indicating the first focal point shift amount is SAE2, and the signal indicating the second focal point shift amount is SAE1, and the spherical aberration correction signal SAE is expressed by:

SAE = SAE2 – k × SAE1,

(where k is a constant that substantially satisfies k = SAE2 / SAE1 when there is no spherical aberration and when the focal point shift amount

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is within a predetermined range).

8. (Amended) The optical head according to claim 1,

wherein the light splitting means includes a polarizing hologram.

9. (Amended) The optical head according to claim 1,

wherein the light receiving element is an integrated light receiving/emitting element that is configured as a single unit with the light source.

10. (Amended) The optical head according to claim 1,

wherein the light receiving element is an integrated optical element in which the light source and the light splitting means are configured as a single unit.

11. (Amended) The optical head according to claim 1, further comprising:

a liquid crystal element provided between the objective lens and the light splitting means, and

spherical aberration correction means for correcting the spherical aberration by changing the phase of wave fronts that pass through the liquid crystal element due to the application of a voltage in accordance with the spherical aberration correction signal created by the spherical aberration detection means.

12. (Amended) An optical disk device, comprising:

an optical head according to claim 7, and

a control circuit for adding an electrical offset to a focus error signal to create a predetermined focal point shift, and determining the constant k such that the fluctuations of the spherical aberration correction signal SAE = SAE2 − k × SAE1 in a range of the predetermined focal point shift are contained within a predetermined range.

13. (Added) The optical head according to claim 1, further comprising:

a collimator lens, provided between the objective lens and the light splitting means, that converts the laser light radiated from the light source to substantially parallel light; and

spherical aberration correction means for correcting the spherical

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aberration by moving the collimator lens in the direction of the optical axis of the laser light, in accordance with the spherical aberration correction signal created by the spherical aberration detection means.

14. (Added) The optical head according to claim 1,

wherein the light splitting means divides the laser light that passes through the two regions that are disposed between the second and third splitting lines into a first plurality of ±1-order diffracted light, and divides the laser light that passes through the four regions that are disposed on the outer side of the second and third splitting lines into a second plurality of ±1-order diffracted light;

wherein the light receiving element has a first plurality of light receiving regions, divided into three, that divides the first plurality of ±1-order diffracted light into three and receives that light, and a second plurality of light receiving regions, divided into three, that divides the second plurality of ±1-order diffracted light into three and receives that light;

wherein the first focal point shift amount is obtained based on a plurality of signals detected by the first plurality of light receiving regions, divided into three; and

wherein the second focal point shift amount is obtained based on a plurality of signals detected by the second plurality of light receiving regions, divided into three.

15. (Added) The optical head according to claim 2,

wherein the light splitting means divides the laser light into 0-order diffracted light, and a plurality of ±1-order diffracted light;

wherein the light receiving element has a light receiving region, divided into four, that divides the 0-order diffracted light into four and receives that light, and

wherein the second push pull signal is obtained based on the signal detected by the light receiving region, divided into four.